

CLAIMS

What is claimed is:

1. A method, comprising:
forming a sacrificial layer on a side of a wafer;
mounting the wafer onto a substrate over the sacrificial layer;
processing the wafer; and
decomposing the sacrificial layer to decouple the wafer and the substrate.
2. The method of claim 1, wherein said sacrificial layer decomposes into gaseous species if heated to a temperature.
3. The method of claim 2, wherein the temperature is in a range between 200 degree Celsius and 250 degree Celsius.
4. The method of claim 2, wherein said sacrificial layer comprises one of:
Polynorbornene, Polyoxymethylene and Polycarbonate.
5. The method of claim 1, wherein said forming the sacrificial layer comprises:
coating a solution of a sacrificial material on the side of the wafer; and
causing solvent vaporization of the solution of the sacrificial material to form the sacrificial layer.
6. The method of claim 5, wherein the solution of the sacrificial material is spray coated on the side of the wafer.

7. The method of claim 1, wherein the side of the wafer comprises contacts; and the sacrificial layer covers the contacts.
8. The method of claim 7, wherein the contacts comprises bumps; and a thickness of the sacrificial layer is substantially smaller than a height of the bumps.
9. The method of claim 1, wherein said mounting the wafer onto the substrate comprises: applying an adhesive layer between the sacrificial layer and the substrate to couple the wafer with the substrate.
10. The method of claim 9, wherein the adhesive layer comprises a double side coated adhesive tape.
11. The method of claim 9, wherein said applying the adhesive layer comprises: spin coating a liquid adhesive over the sacrificial layer; placing the substrate on the liquid adhesive layer; and curing the liquid adhesive to form the adhesive layer.
12. The method of claim 1, wherein said processing the wafer comprises: thinning the wafer from a first thickness to a second thickness.
13. The method of claim 12, wherein the second thickness is less than 150 microns.
14. The method of claim 12, wherein said processing the wafer further comprises: depositing backside metal (BSM) on the wafer.

15. The method of claim 1, wherein said decomposing comprises:
exposing the wafer to heat for a period of time to decompose the sacrificial layer.
16. The method of claim 15, wherein the wafer is exposed to heat in an oven; and the period of time is in a range from 5 minutes to 10 minutes.
17. The method of claim 15, further comprising:
mounting the wafer on a tape; and
detaching the substrate together with an adhesive layer from the wafer mounted on the
tape;
wherein the adhesive layer is formed over the sacrificial layer and between the wafer
and the substrate to mount the wafer onto the substrate.
18. The method of claim 15, wherein after the substrate is detached from the wafer, the side of the wafer is substantially free of residual traces.
19. The method of claim 15, further comprising:
plasma cleaning the side of the wafer after the substrate is detached from the wafer.
20. A method, comprising:
forming a sacrificial layer over bumps on a side of a wafer;
mounting over the sacrificial layer the side of the wafer onto a substrate;
thinning the wafer; and
thermally destructing the sacrificial layer to decouple the wafer and the substrate.

21. The method of claim 20, wherein said mounting comprises:
applying an adhesive layer over the sacrificial layer and between the side of the wafer
and the substrate.
22. The method of claim 21, wherein when the sacrificial layer is decomposed, adhesion
of the adhesive layer between the wafer and the substrate is reduced.
23. The method of claim 22, wherein said thermally destructing the sacrificial layer
comprises heating the wafer in an oven.
24. A method, comprising:
coating a solution of a sacrificial material over bumps on a bump side of a wafer to
form a sacrificial layer after solvent vaporization;
applying an adhesive layer over the sacrificial layer to bond the wafer to a support
substrate;
thinning the wafer supported by the support substrate;
exposing the wafer to heat for decomposition of the sacrificial layer, the
decomposition of the sacrificial layer reducing adhesion of the adhesive layer
to the wafer;
attaching the wafer, on a side opposite to the bump side of the wafer, to a tape; and
detaching the support substrate together with the adhesive layer from the wafer.
25. The method of claim 24, wherein the decomposition of the sacrificial layer causes the
adhesion of the adhesive layer to the wafer to be smaller than adhesion of the adhesive
layer to the support substrate.

26. The method of claim 25, wherein the sacrificial layer is decomposed into gases when the wafer is exposed the heat; the adhesive layer remains adhering to the wafer after the decomposition of the sacrificial layer; and when the support substrate is detached from the wafer, the bump side of a wafer is substantially free of residue traces from the sacrificial and adhesive layers.
27. The method of claim 24, wherein said applying the adhesive layer comprises:
shinning ultraviolet (UV) light through the support substrate on an adhesive material
of a liquid form to cure the adhesive material into a solid form in a room
temperature to bond the wafer to the support substrate.
28. A wafer assembly, comprising:
a wafer, the wafer having a side;
a layer of a sacrificial material coated on the side of the wafer;
an adhesive layer coupled to the layer of the sacrificial material on the side of the
wafer;
wherein the sacrificial material is capable of decomposing when heated.
29. The wafer assembly of claim 28, wherein a distribution of the sacrificial material coated on the side of the wafer is substantially uniform.
30. The wafer assembly of claim 29, wherein the sacrificial material comprises one of:
Polynorbornene, Polyoxymethylene and Polycarbonate; wherein the sacrificial
material decomposes into gases when heated.